A 57. 46/3:5/959

Here, on Mt. Rose, Nevada, Dr. J. E. Church made the first western snow survey 50 years ago.

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# FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEY and WATER SUPPLY FORECASTS for

# MONTANA & NORTHERN WYOMING

UNITED STATES DEPARTMENT of AGRICULTURE...SOIL CONSERVATION SERVICE, and

MONTANA AGRICULTURAL EXPERIMENT STATION



In cooperation with the U.S. Forest Service, U.S. Geological Survey, National Park Service, U.S. Bureau of Reclamation, State Engineers of Montana and Wyoming and other Federal, State and private organizations.

MAY 1, 1959

#### UNITED STATES DEPARTMENT OF AGRICULTURE - SOIL CONSERVATION SERVICE

TO RECIPIENTS OF COOPERATIVE SNOW SURVEY AND WATER SUPPLY FORECAST REPORTS:

The climate of the cultivated and populated areas of the West is characterized by relatively dry summer months. Such precipitation as occurs falls mostly in the winter and early spring months when it is of little immediate benefit to growing crops. Fortunately, most of this precipitation falls as mountain snow which stays on the ground for months, melting later to sustain streamflow during the period of greatest demand during late spring and summer. Thus, nature provides in mountain snow an imposing water storage facility.

The amount of water stored in mountain snow varies from place to place as well as from year to year and accordingly, so does the runoff of the streams. The best seasonal management of variable western water supplies results from fore-knowledge of the runoff.

A snow survey consists of a series of about ten samples taken with specially designed snow sampling equipment along a permanently marked line, about 1000 feet in length, called a snow course. The use of snow sampling equipment provides snow depth and water equivalent values for each sampling point. The average of these values is reported as the snow survey measurement for a snow course.

Snow surveys are made monthly or semi-monthly beginning in January or February and continue through the snow season until April, May or June. Currently more than 1300 western snow courses are measured each year. These measurements furnish the key data for water supply forecasts.

By relating snow survey measurements taken over a period of years to spring-summer runoff during the same period, relationships have been developed which make it possible to forecast seasonal runoff several months in advance of occurrence. In order to make a forecast, once a forecast relationship has been developed, the maximum snow water content at previously selected key snow courses is usually entered in the forecast relationship. More accurate forecasts are often obtained when other factors such as soil moisture, base flow and spring precipitation are considered and included in the forecast relationships.

Listed below are the Federal-State-Private Cooperative Snow Survey and Water Supply Forecast reports available for the West which contain detailed information on snow survey measurements, streamflow forecasts, reservoir storage, soil moisture and other guide data to water management and conservation decisions.

#### PUBLISHED BY SOIL CONSERVATION SERVICE

REPORTS	ISSUED	COOPERATING WITH	LOCATION
RIVER BASINS			
Colorado, Rio Grande	MONTHLY (FEBMAY)	COLO. EXP. STATION COLO. STATE ENGINEER NEW MEXICO STATE ENGII	
COLUMBIA Includes Alaska	MONTHLY (JAN MAY)		BOISE, IDAHO
UPPER MISSOURI	MONTHLY (FEBMAY)	Mont.Agr.Exp.Station	BOZEMAN, MONTANA
WEST-WIDE	(OCT. 1. APR. 1 AND MAY 1)	COOPERATORS	PortLand, Oregon
STATES			
Arizona	SEMI-MONTHLY (JAN. 15-APR.1)	SALT R. VALLEY WATER USERS ASSOCIATION	PHOENIX, ARIZONA
Nevada	MONTHLY (FEBAPR.)	NEVADA STATE ENGINEER	RENO, NEVADA
ORE GON	MONTHLY (JANMAY)	Ore.Agr.Exp.Station	PORTLAND, OREGON
UTAH	MONTHLY (JANMAY)	UTAH STATE ENGINEERUTAH AGR.EXP.STATION	SALT LAKE CITY, UTAH
Washington	Monthly (FEBMay)	Wash. State Dept. Of Conservation	SPOKANE, WASHINGTON
Copies of the	various reports may b	e secured from: Head, Water S Soil Conserva	Supply Forecasting Section ation Service

#### PUBLISHED BY OTHER AGENCIES

209 S.W. 5th Avenue, Portland 4, Oregon

0	THER SNOW S	SURVEY	REPORTS								
	BRITISH CO	LUMBIA.		.MonTHLY	(FEB	June)	TROLLER. FORESTS.				
	CALIFORNIA	٠		.MonTHLY	(FEB.	-MAY)	 .CALIFORN		ATER F	lE S O U	RCES.



## FEDERAL-STATE-PRIVATE COOPERATIVE

SNOW SURVEYS and WATER SUPPLY FORECASTS

for

MONTANA AND NORTHERN WYOMING

(Upper Missouri and Upper Columbia River Basins)

Report Prepared by:

A. R. Codd Hydraulic Engineer Soil Conservation Service

Soil Conservation Service
U. S. Department of Agriculture
and
Montana Agricultural Experiment Station
Bozeman, Montana

Report Issued by:

H. D. Hurd State Conservationist of Montana O. W. Monson
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Montana Agricultural
Experiment Station

R. E. Huffman Director Montana Agricultural Experiment Station



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## WATER SUPPLY OUTLOOK FOR MONTANA May 1, 1959

The 1959 Water Supply Outlook for the State of Montana is GOOD. The only apparent shortage is in the extreme southern end of the Beaverhead River, where a 75 percent normal supply is forecast.

The Sun River inflow to Gibson Reservoir is forecast at 159 percent average or 912,000 acre feet for the April-September period. Stations along the Missouri and Yellowstone Rivers are forecast for near normal flows this season.

The Blackfoot River near Bonner, the Swan River at Big Fork, and the Clark Fork River above Missoula are forecast to have extremely high flows from the record snow-pack in the mountains feeding these streams.

The April-September flow of the Clark Fork is forecast at 135 percent average below Missoula; a decrease to 125 percent average is forecast at Plains and Thompson Falls.

For May first, irrigation and hydro-electric reservoirs are at satisfactory levels to receive the anticipated spring runoff from the winter snow-pack.

In the Flathead basin, soil moisture under the snow-pack is, in general, slightly higher than last season.

At Bozeman, soil moisture is one-half inch less than last season.



#### MISSOURI RIVER BASIN

### JEFFERSON RIVER:

The Red Rock portion of the Beaverhead River is forecast to flow 25 percent below average this season. This is the only apparent shortage in the State. April precipitation was only 27 percent of normal at Lima and snow cover on April first was 25 percent below average. The tributaries to the Beaverhead River between Armstead and Barratts are forecast to cover the apparent shortage. The April-July flow at Barratts on the Beaverhead is forecast to be 94 percent average or 126,000 acre feet.

#### MADISON RIVER:

May first snow surveys on the Madison River indicate that an above-average snow-pack exists at high elevations; low elevation snow-pack is below average or non existent. This could mean a prolonged runoff period.

### GALLATIN RIVER:

Snow surveys made on May first indicate an above-average water supply for this river this season. The snow course at Devil's Slide, elevation 8,100 feet, showed 30.6 inches water content. This measurement is only one inch less than the record high of 31.6 water content measurement made in 1948.

#### MISSOURI RIVER MAIN STEM:

May first snow surveys on the tributaries to the Missouri between Toston and Fort Benton indicate an above-average snow-pack for this late in the season. Record high measurements at Kings Hill, Stemple Pass and Upper Tenmile Creek snow courses could produce local high water and a prolonged seasonal runoff.

### UPPER YELLOWSTONE RIVER, MONTANA

May first snow surveys at a few key stations indicate a GOOD water supply outlook for the Yellowstone River and tributary streams from Gardiner to Livingston. The Yellowstone River is forecast to flow 99 percent average and 26 percent greater than last season. There was a normal decline of snow water content during April.

### SHIELDS RIVER BASIN:

Although no snow surveys are made on May first in this basin, precipitation has been close to average at most stations. The April forecasts have not been lowered. The Shields River and tributaries should produce about 9 percent more water than last season and 90 percent of the average year.



#### COLUMBIA RIVER BASIN

#### FLATHEAD RIVER:

May first snow surveys indicate an above-average snow-pack this season. A heavy snow-pack of record proportions exists on the high elevation snow courses on the Mission and Swan mountains. Record water content measurements exist at Big Creek, east of Polson; North Fork Jocko, east of St. Ignatius; Trinkus Lake, Upper Holland Lake and Strawberry Lake on the Swan Range; and on Big Mountain, north of Kalispell. This heavy snow-pack is likely to cause extremely high water in the streams being fed from this area. The snow-pack on these courses is greater than it was in 1950.

The Flathead River at Columbia Falls is forecast to flow 117 percent average or 6,502,000 acre feet from April 1 through September 30. The South Fork of the Flathead River is forecast to flow 2,404,000 acre feet for the April-September period, with 2,034,000 acre feet during April, May and June. These figures are 117 percent of the average.

#### CLARK FORK RIVER:

The upper portion of the Clark Fork River, from Butte to Milltown, has a good snow-pack this season. All courses measured about May first were above average. The Clark Fork River above Bonner is forecast to flow 117 percent average this season.

The Blackfoot basin, to the north of the Clark Fork, has a heavy snow-pack at the higher elevations. May first snow survey measurements show record highs, exceeding 1950 by 4 inches of water content. This heavy snow-pack is certain to bring high spring flows during June and July. The Blackfoot River at Bonner is forecast at 169 percent average or 1,363,000 acre feet of water during the April-July period. This flow will enter the Clark Fork River above Missoula with a forecast of 151 percent average flow for the April-July period or 2,160,000 acre feet.

The Bitterroot River basin will produce only 107 percent of the average flow during the runoff season.



### MONTANA STREAM-FLOW FORECASTS MAY 1, 1959

The following summarized runoff forecasts are based principally on mountain snow cover and on the assumption that precipitation and temperature during the forecast period will be near average. Appreciable deviations from normal of temperature and/or precipitation during the forecast period will correspondingly modify these forecasts.

				-Flow in T	housands	of Acre	
UPPER MISSOURI RIVER		FORECAST	%	FORE-			1938-52
IN MONTANA		RUNOFF	15-Yr.	CAST	Measured		Average
			AVG.	PERIOD	1957##	1956	
RED ROCK RIVER							
Monida (near) (1)	<i>#</i> 5	61	75	Apr-Sept	104	60	81
Monitua (Hear) (1)	# <i>J</i>	57	75	Apr-July	100	58	76
BEAVERHEAD RIVER		)	()	Apr -oury	100	70	
Barratts (at)	#9	166	94	Apr-Sept	204	155	177
	11 /	126	94	Apr-July	162	122	134
BIG HOLE RIVER		andrewing and recognized an energy talk intercompletion and executions and					
Melrose (near)	#85	631	85	Apr-Sept	720	842	745
		584	85	Apr-July	686	796	687
JEFFERSON RIVER							
Sappington (at)	#14	879	83	Apr-Sept	1028	1045	1057
		780	83	Apr-July	964	967	938
MADISON RIVER	11			C to a constant	and the second s		
West Yellowstone (near)	#104	183	93	Apr-Sept	220	255	198
		140	93	Apr-July	168	200	151
Grayling (near) (2)	#106	382	91	Apr-Sept	454	488	420
(Net inflow to Hebgen Lk)		302	91	Apr-July	361	402	333.
McAllister (near) (3)	#109	661	91	Apr-July	750	802	726
OATTAMEN DITTED		533	91	Apr-July	615	672	585
GALLATIN RIVER	//= = .	100	770		1/0	100	~
Gateway (near)	#114	487	110	Apr-Sept	469	499	445
T	11227	420	109	Apr-July	406	443	384
Logan (at)	#116	539	112	Apr-Sept	446	512	478
77 7 1 0 0 0 0 ( 1) (0)	//2 7 6	462	112	Apr-July	386	452	410
Hyalite Cr. R.S. (at)(7)	#TT8	40	114	Apr-Sept	34	29	35
MISSOURI RIVER		34	114	Apr-July	30	25	30
Toston (at) (3)	47 E	2075	82	Ann Cont	2187	2215	2525%
108 (011 (80) (5)	#15	1756	02 81	Apr-Sept Apr-July	1956	2345 2098	2535* 2191*
Fort Benton (at) (4)	#25	3335	99	Apr-Sept	3032	3131	3381
TOTO DELICOIT (ac) (4)	ガベン	2812	99 98	Apr-Sept Apr-July	2608	2722	2874
Virgelle (at) (4)	#26	4098	102	Apr-Sept	3500	3261	4013
(Loma)	11~0	3499	102	Apr-July	3019	2806	3445
Zortman (near) (4)	#27	4481	103	Apr-Sept	3739	3588	4357
(	11.51	3814	102	Apr-July	3208	3076	3726
Ft.Peck Dam (below)(5)	#29	4396	101	Apr-Sept	3365	3290	4362
	., ,	3809	102	Apr-July	2728	2613	3666
Williston, N. D.	#33	10913	92	Apr-Sept	11203	9673	11750
, and the second second		9438	92	Apr-July	9527	8102	10228

<sup>(1)</sup> Observed flow plus change in storage in Lima Reservoir.

(4) Observed flow plus change in storage in Canyon Ferry.

(7) Observed flow plus change in storage in Hyalite Reservoir.

<sup>(2)</sup> Observed flow plus change in storage in Hebgen Lake.

<sup>(3)</sup> Observed flow plus change in storage in Hebgen and Ennis Lakes.

<sup>(5)</sup> Observed flow plus change in storage in Canyon Ferry and Ft. Peck Reservoirs.

<sup>(\*)</sup> Less than 15 years in 1938-52 period. Average for 15 yrs. nearest the base period. (##) Preliminary data furnished by U. S. Geological Survey, subject to correction.



## MONTANA STREAM-FLOW FORECASTS MAY 1, 1959

	_			-Flow in T	housands	of Acre	
UPPER MISSOURI RIVER		ORECAST	%	FORE-			1938-52
IN MONTANA		RUNOFF	15-Yr.	CAST	Measured		Average
			AVG.	PERIOD	1957##	1956	
SUN RIVER							
Net Inflow to Gibson							
Reservoir	#1535	912	159	Apr-Sept	531	668	573*
		833	159	Apr-July	488	618	524*
MARIAS RIVER							
Shelby (near)	#178	622	118	Apr-Sept	519	684	527
		572	119	Apr-July	486	617	482
JUDITH RIVER	// m = m						
Utica (near)	#208	48	121	Apr-Sept	29.2	18.4	39.8
		44	121	Apr-July	27.6	17.6	36.3
MUSSELSHELL RIVER	1107 /	0.0	7.00		( 0	, 0	( 0)
Delpine (near)	#216	8.2	120	Apr-Sept	6.0	4.8	6.8*
THE TOLLOW ON THE PARTY OF THE		6.7	120	Apr-July	4.9	4.1	5.6*
YELLOWSTONE RIVER	//27.00	7.000	06	A Co-+	706/	2,277	7,070
Corwin Springs (at)	#317	1792	96 06	Apr-Sept	1964	2427	1870
Tioning to the control of the contro	<i>Д</i> 2 <b>1</b> 0	1495	96	Apr-July	1643	2099	1556 2134
Livingston (near)	#318	2038 1693	96	Apr-Sept	2272	2322	1770
Billings (at)	#319	3659	95 91	Apr-July Apr-Sept	1902 5133	4788	4025
prinings (ac)	#319	3142	91	Apr-July	4521	4225	3446
Miles City (at)	#323	5842	92	Apr-Sept	7762	6175	6369
miles oldy (ad)	πンペン	5000	92	Apr-July	6764	5324	5421
Sidney (near)	#326	6054	91	Apr-Sept	7623	6114	6648
Sidiley (medi)	11 2~0	5246	92	Apr-July	6735	5315	5724
SHIELDS RIVER		<u> </u>		IIPI G GILJ	1	7727	71~4
Clyde Park (at)	#335	95.4	90	Apr-Sept	76.5	97.0	105.6
	,, , , , ,	88.88	91	Apr-July	71.8	94.2	98.0
ROSEBUD RIVER						7.7.	
Absarokee (near)	#356	265	101	Apr-Sept	372	251	263
		214	101	Apr-July	321	208	212
STILLWATER RIVER							
Rosebud Cr. (above)	#3515	333	101	Apr-Sept	463	343	331
· · · · ·	,,,,,	290	101	Apr-July	413	321	288
Absarokee (near)	#352	596	100	Apr-Sept	850	611	594
		501	100	Apr-July	750	529	500
ROCK CREEK							
Red Lodge (near)	#365	107	100	Apr-Sept	154	134	107
		82	100	Apr-July	129	110	82
CLARK FORK RIVER					and processing	,	To and the second
Chance (at)	#360	599	103	Apr-Sept	715	716	580
		536	104	Apr-July	649	660	517
Edgar (at)	#362	619	101	Apr-Sept	785	773	614
		547	101	Apr-July	706	698	539

<sup>(##)</sup> Preliminary data furnished by U. S. Geological Survey, subject to correction.

(\*) Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.



# WYOMING STREAM-FLOW FORECASTS MAY 1, 1959 Prepared by SCS, Casper, Wyoming

Season	al Stream	-Flow in T	housands	of Acre	Feet
FORECAST	%	FORE-			1938-52
RUNOFF	15-Yr.	CAST	Measured	Runoff	Average
	AVG.	PERIOD	1957	1956	
66	77	Apr-Sept	123	96	86*
34	70	Apr-Sept	62	44	49**
92	90	Apr-Sept	146	114	102**
780	95	Apr-Sept	1115	1014	823
	FORECAST RUNOFF  66  34	FORECAST % 15-Yr. AVG.  66 77  34 70  92 90	FORECAST % FORE-CAST PERIOD  66 77 Apr-Sept  34 70 Apr-Sept  92 90 Apr-Sept	FORECAST % FORE- CAST Measured 19-4 PERIOD 19-57  66 77 Apr-Sept 123  34 70 Apr-Sept 62  92 90 Apr-Sept 146	RUNOFF         15-Yr. AVG.         CAST PERIOD         Measured Runoff 1957         Runoff 1956           66         77         Apr-Sept         123         96           34         70         Apr-Sept         62         44           92         90         Apr-Sept         146         114

<sup>(1)</sup>Observed flow corrected for storage in Buffalo Bill Reservoir and Hart Mountain Diversion.

<sup>\*</sup> Less than 15 years in 1938-52 period. Average for 15 years nearest the base period. \*\*Estimated 1938-52 average.



## MONTANA STREAM-FLOW FORECASTS MAY 1, 1959

		Co	-1 Ctma	. 177 in M	h assa and a	of Asso	Post
TIPLE COLINGTA DIVID				Flow in T	nousanus	ol Acre	
UPPER COLUMBIA RIVER		FORECAST	% 3.5. V	FORE-	Ma	D	1938-52
IN MONTANA		RUNOFF	15-Yr.	CAST	Measured		Average
			AVG.	PERIOD	1957##	1956	
CLARK FORK RIVER				-		,	
	#4155	905	117	Apr-Sept	655	880	771
	" 1>>	797	117	Apr-July	580	780	578
		683	117	Apr-June	522	695	583
Missoula (above)	#415	2418	151	Apr-Sept	1577	2012	1602
	.,	2160	151	Apr-July	1425	1817	1429
		1857	151	Apr-June	1292	1622	1229
Missoula (below)	#439	4023	135	Apr-Sept	2979	3960	2971
· ·	.,	3668	136	Apr-July	2764	3654	2700
		3213	137	Apr-June	2524	3290	2335
St. Regis (at)	#442	5398	137	Apr-Sept	4108	5749	3951
		4897	136	Apr-July	3787	5326	3588
		4339	139	Apr-June	3450	4817	3112
Plains (near) (15)	#503	13436	125	Apr-Sept	11159	15138	10747
		12268	125	Apr-July	10459	14070	9813
		10544	125	Apr-June	9527	12531	8434
Thompson Falls (at) (15)	#504	14345	125	Apr-Sept	11517	15920	11479
		13122	125	Apr-July	10820	14809	10500
		11258	125	Apr-June	9847	13188	9009
Cabinet Gorge (at)(15)	#507	15261	125	Apr-Sept			12211
		13980	125	Apr-July			11186
		11978	125	Apr-June			9584
BLACKFOOT RIVER							
Bonner (near)	#414	1513	169	Apr-Sept	922	1132	896**
		1363	168	Apr-July	844	1037	811**
		1174	169	Apr-June	769	927	693**
BITTERROOT RIVER							
Darby (near)	#422	557	106	Apr-Sept	515	740	525
		517	106	Apr-July	483	701	487
		452	105	Apr-June	441	649	429
Missoula (near) (16)	#438	1605	117	Apr-Sept	1402	1948	1369
		1508	119	Apr-July	1340	1837	1270
		1356	123	Apr-June	1232	1668	1106

<sup>(14)</sup> Difference in observed flow, Clark Fork above Missoula & Blackfoot at Bonner.

<sup>(15)</sup> Observed flow plus change in storage in Flathead Lake & Hungry Horse Reservoir.

<sup>(16)</sup> Difference in observed flow, Clark Fork above and below Missoula.

<sup>(\*\*)</sup> Average for period of record.

<sup>(##)</sup> Preliminary data furnished by U. S. Geological Survey, subject to correction.



# MONTANA STREAM-FLOW FORECASTS MAY 1, 1959

			housands (	of Acre	Feet
	•				1938-52
RUNOFF	15-Yr.	CAST		Runoff	Average
	man maka nakan maka apama barandar sa ana hiirma kanandaran, maka jala kang kapalar Bala sa Janga, ayir Manaman karandar garan galah kangayan kapalaran sa sa sa sa kangayan sa sa kanandar sa sa s	PERIOD	1957##	1956	
2020	117	Apr-Sept	1798	2308	1729
1840	117	Apr-July	1681	2139	1575
1585	117	Apr-June	1523	1864	1350
6502	116	Apr-Sept	5716	7164	5619
6061	116	Apr-July	5411	6720	5214
5312	117	Apr-June	4962	5959	4530
7654	116	Apr-Sept	6525	8603	6612
7120	116	Apr-July	6240	8082	6150
6156	116	Apr-June	5715	7137	5317
1947	117	Apr-Sept	1764	2093	1659*
	-				1540*
		_	1		1330*
2404	117	Apr-Sept	1976	2593	2058
·					1950
	-	_	1		1724
910	156	Apr-Sept	575	750	584
809					518
674	157	Apr-June	451	581	427
	FORECAST RUNOFF  2020 1840 1585 6502 6061 5312 7654 7120 6156  1947 1802 1522  2404 2283 2034  910 809	FORECAST % 15-Yr.  2020 117 1840 117 1585 117 6502 116 6061 116 5312 117 7654 116 7120 116 6156 116  1947 117 1802 117 1522 114  2404 117 2283 117 2034 118  910 156 809 156	FORECAST	FORECAST	RUNOFF       15-Yr.       CAST PERIOD       Measured Runoff         2020       117       Apr-Sept 1798       2308         1840       117       Apr-July       1681       2139         1585       117       Apr-June       1523       1864         6502       116       Apr-Sept 5716       7164       6061       116       Apr-July       5411       6720         5312       117       Apr-June       4962       5959         7654       116       Apr-Sept 6525       8603         7120       116       Apr-July       6240       8082         6156       116       Apr-June       5715       7137         1947       117       Apr-Sept 1764       2093       1802       117       Apr-July       1672       1956         1522       114       Apr-June       1524       1712         2404       117       Apr-Sept 1976       2593         2283       117       Apr-July       1857       2488         2034       118       Apr-Sept 575       750         809       156       Apr-Sept 575       750         809       156       Apr-

<sup>(15)</sup> Observed flow plus change in storage in Flathead Lake & Hungry Horse Reservoir. (17) Observed flow plus change in storage in Hungry Horse Reservoir.

<sup>(##)</sup> Preliminary data furnished by U. S. Geological Survey, subject to correction. (\*) Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.



# AVAILABLE SOIL MOISTURE - ABOUT MAY 1, 1959

			F	PROFILE Total Water-			OISTUR in Inc	E CONTE	NT	Y e
Station	No.	Elev.	Depth (In.)	Holding Capacity	Date of Meas.	1959	Past 1958	Record 1957	Avg.	a r s
		<u>CO</u>	LUMBIA	- FLATHEA	D DRAIN	JAGE				
Desert Mt.	13A2M	5600	48		4/29	11.30	9.37	8.39	_	3
Marias Pass	13A5M	5250	48	8.39	4/25	6.62	6.99	7.28	7.07	5
Spotted Bear R.S.	13B2M	3700	28		5/5	4.97	4.73	5.45	-	3
Trout Lake	13A12M	3600	48		5/4	12.30	12.78	12.38	_	3
		MIS	SSOURI	- GALLATI	N DRAIN	IAGE				
College Site	11D2M	<b>48</b> 60	50	14.48	5/1	11.91	12.34	11.35	-	3



# MONTANA SNOW SURVEYS ABOUT MAY 1, 1959

		<del></del>			SNOW C	OVER M	EASUREME	NTS	
MISSOURI DRAINAGE BASIN			Date	1959 Snow	Water		ast Reco		Total Years
AND SNOW COURSE	No.	Elev.	of Survey	Depth (In.)	Content (In.)	1958	1957	15-Year Average 1938-52	of Record
JEFFERSON RIVER									
(Rock-Beaverhead) Lakeview Canyon Lakeview Ridge (Big Hole)	11E4 11E3	6930 7400	5/4 5/4	11 7	3.6 2.5	13.2	12.2	10.5* 8.1*	8
Gibbons Pass Storm Lake (Wise River)	13D2 13C7	7100 7780	4/29 4/30	53 38	22.4 15.3	26.5	26.0 16.4	20.6* 14.2*	23 17
Elk Horn	13D15	8450	4/30	25	8.8	11.8	10.6	7.0*	16
MADISON RIVER									
Hebgen Norris Basin Twenty-One Mile W. Yellowstone	11E5 10E2 11E6 11E7	6550 7500 7150 6700	4/30 4/29 5/1 4/30	12 13 31 6	4.3 4.9 12.3 2.0	8.9 7.7 14.4 5.0	12.4 8.1 21.5 10.8	2.6 5.4* 11.8 3.6	26 8 22 25
GALLATIN RIVER									
Devil's Slide Hood Meadow Twenty-One Mile	10D4 10D3 11E6	8100 6600 7150	5/2 5/2 5/1	75 22 31	30.6 7.9 12.3	26.6 10.4 14.4	24.6 9.6 21.5	22.0 4.3 11.8	24 24 22
MISSOURI RIVER MAI	IN STEM								
Chessman Res. King's Hill Pipestone Pass Stemple Pass Tenmile, Lower Tenmile, Middle Tenmile, Upper (Marias River)	1205 1001 1201 1201 1202 1203 1204	6200 7950 7200 6900 6250 6800 8000	4/30 5/1 5/1 5/1 5/3 5/2 5/2	7 48 11 37 7 29 39	2.5 17.6 3.2 13.4 2.3 9.2 14.6	4.8 14.6 10.4 13.4 6.7 13.4 18.5	3.1 13.4 5.2 9.5 6.6 11.9 15.1	1.6 12.7* 2.2* 6.8* 2.0 6.9 10.4	23 18 19 24 23 24 23
Marias Pass	13A5	5250	4/29	50	21.4	15.5	17.0	9.9	24
UPPER YELLOWSTONE									
Canyon Cooke City Lake Camp Lupine	10E3 10D7 10E4 10E1	7500 7400 7850 7300	5/1 4/30 4/30 4/29	34 20 23 21	11.8 6.7 6.5 7.1	14.3 7.8 9.4 7.4	17.3 8.2 9.3 8.9	12.0** 6.2** 8.7** 8.8**	12 14 13 8

<sup>\*</sup>Less than 15 years in 1938-52 period. Average for 15 years nearest the base period. \*\*Average for period of record.



# MONTANA & WYOMING SNOW SURVEYS ABOUT MAY 1, 1959

	<del> </del>				SNOW C	OVER M	EASUREME	NTS	
MISSOURI				1959	D21.011 0	*******************	ast Reco	taribus mandalare has diliti di Mandalari katalari katalari katalari katalari katalari katalari katalari katal	Total
DRAINAGE BASIN			Date	Snow	Water	16	Content		Years
AND	<b>NT</b> -	70.7	of		Content		1055	15-Year	of
SNOW COURSE	No.	Elev.	Survey	(In.)	(In.)	1958	1957	Average 1938-52	Record
,			HUDSON	BAY DR.	AINAGE				
ST. MARY BASIN									
Iceberg Lake	13A3	5750	5/1	72	33.5	26.4	26.2	19.7	37
Josephine Lake #9	13A14	4900	4/30	49	20.3	15.8	19.6	20.1**	1 ,
Mount Allen Piegan Pass #6	13A7 13A6	5700 6250	4/30 4/30	118 49	54.6 20.3	44.3 37.8	48.3 41.3	39.9 29.5	37 37
Ptarmigan #8	13A8	6000	5/1	98	46.6	34.6	39.1	29.7	22
			•		•			•	F. All Control of the
			<u> </u>	YOMING					
LOWER YELLOWSTONE	- Clark	's Fork	•						
Lodgepole	9E1	8200	5/1	32	10.9	9.2	12.6	9.5*	19
LOWER YELLOWSTONE	- Wind	River			Stray of the Committee				
Big Warm	9F12	8800	4/25	24	7.5	4.7	11.8	-	4
Burroughs Creek	9F4	8800	4/26 4/27	41	14.3	10.8	15.7	15.8**	10
Dinwoodie	9F10	10000	4/27	45	12.7	10.8	16.4	15.4**	
Dry Creek Dunoir	9F9 9F6	9500 8750	4/28 4/25	28 21	7.0	5.9 5.2	10.4	8.3** 7.4*	10 17
Geyser Creek	9F7	8500	4/25	17	5.4	4.1	10.7	6.6**	
Little Warm	9F8	9500	4/25	57	17.4	16.6	23.9	21.0**	
Sheridan R. S. #2	9F14	7500	4/27	9	0.5	2.7	8.0	e=0.	4
T-Cross Ranch	9F3	0008	4/26	8	2.7	1.9	7.4	4.6*	16
#Togwotee Pass	10F9	9600	5/1	78	33.2	29.4	32.7	34.3**	10

<sup>\*</sup> Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.

\*\* Average for period of record.

# Adjacent Basin.



# WYOMING SNOW SURVEYS ABOUT MAY 1, 1959

					SNOW C	OVER M	EASUREME	NTS	dammer servicem delicites sor de Microbio Linco de Service.
MISSOURI				1959	DITON O		ast Reco		Total
DRAINAGE BASIN			Date	Snow	Water		Content		Years
AND			$\mathtt{of}$	Depth	${\tt Content}$			15-Year	of
SNOW COURSE	No.	Elev.	Survey	(In.)	(In.)	1958	1957	_	Record
								1938-52	
LOWER YELLOWSTONE	- Popo	Agie Ri	.ver						
Blue Ridge	8G2	9500	5/2	23	7.0	12.2	15.3	12.5*	19
Bruce's Camp	8G5	6500	5/2	Ō	0	N.R.		_	3
Hobbs Park	9G3	10000	4/29	53	6.5	16.4	22.7	22.4**	
Mosquito Park R.S.	9G4	9500	4/29	23	6.6	9.0	13.9	8.3**	14
Sawmill Glade	5G1	8500	5/2	10	2.9	9.4	11.6	6.8*	19
South Pass	8G3	9000	5/2	23	7.4	11.4	19.0	14.6*	19
St. Lawrence R.S.	9F11	9000	4/28	20	5.6	5.6	11.4	7.6*	15
Trout Creek	9G2	8400	4/29	10	2.9	6.1	10.4	3.2**	10
LOWER YELLOWSTONE	- Owl	Creek							
Beavers Mill	9F2	8900	4/28	21	7.0	N.R.	9.4	8.3	7
Owl Creek	8F1	8700	4/28	25	6.5	9.0	8.2	7.6**	i '
LOWER YELLOWSTONE	- Grey	bull Riv	er						
Timber Creek #2	9 <b>E</b> 3	8800	4/26	8	2 #	6.8	9.0		,
Wood River	9F15	8000	4/20	15	3.5 4.8	7.0	12.4		4 4
	,,			-2	.,,,,				
LOWER YELLOWSTONE	- Shos	hone Riv	er		-				
Carter Mountain	9E4	7800	4/25	17	4.5	9.6	12.7		2
East Entrance	10E6	7000	4/29	14	6.1	7.8	10.2		5
Sylvan Pass	10E5	7100	4/29	34	13.2	12.6	15.1	8.8*	17
#Togwotee Pass	10F9	9600	5/1	78	33.2	29.4	32.7	34.3**	10
LOWER YELLOWSTONE	- Nowo	od Creek							
Cold Springs Camp	7E25	8700	5/3	30	10.0	7.2	6.1		3
Medicine Lodge Lk.	7E24	9500	5/3	49	15.3	11.8	0.1		2
Munkres Pass	7E8	9700	4/30	40	11.7	12.2	11.4	9.8**	8
Onion Gulch	7E27	8100	4/30	39		10.3	8.2	,	3 2 8 3 2
West Tensleep Lake		9075	4/29	49		11.7			2
Tensleep R.S.	7E7	8300	4/29	29	10.0	7.4	1.9	4.5	23
Tyrell R.S.	7E35	8300	4/29	39	12.4	9.0	N.R.		2

<sup>\*</sup>Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.
\*\*Average for period of record.
#Adjacent Basin.



# WYOMING SNOW SURVEYS ABOUT MAY 1, 1959

					ONO!	OTTIED 35	ייי אייי הייי אייי אייי אייי אייי אייי	NY/III C						
MISSOURI				1959	SNOW C	OVER MEASUREMENTS Past Record Total								
DRAINAGE BASIN			Date	Snow	Water	Water	Years							
AND SNOW COURSE	No.	Elev.	of Survey		Content (In.)		1957	15-Year	of Record					
LOWER YELLOWSTONE	- Shell	L Creek												
Bald Mountain Beaver-Tongue Div. Bone-Spring Div. Granite Cr. Camp Granite Pass Ranger Creek Shell Creek	7E21 7E20 7E18 7E22 7E17 7E4 7E23	9600 9200 9200 7800 8950 8800 9600	4/25 4/24 4/27 5/1 4/27 5/1 5/1	85 78 73 T. 67 35 59	30.9 29.8 23.8 22.5 12.2 18.3	19.9 17.0 20.3 1.5 20.3 8.2 15.2	23.5 19.3 19.8 0 19.9 9.2 15.6	6.4*	3 3 3 3 22 3					
LOWER YELLOWSTONE	- Porcu	pine Cr	eek											
Five Springs Falls Medicine Wheel	7E31 7E30	7500 9000	4/30 4/25	33 70	12.0 25.9	7.2 14.8	5.6 16.3		3 3					
LOWER YELLOWSTONE	- Tongu	le River												
Beaver-Tongue Div. Big Goose #2 Bone-Spring Div. Burgess R.S. #2 Dome Lake #2 Gloom Creek Granite Pass Sibley Lake Sucker Creek Steamboat Point Wood Rock G.S.	7E20 7E32 7E18 7E33 7E34 7E14 7E17 7E11 7E12 7E10 7E13	9200 7700 9200 7900 8800 9300 8950 8000 9000 7500 8500	4/24 4/29 4/27 4/25 4/30 4/26 4/27 4/28 4/26 4/28	78 31 73 40 41 60 67 47 56 41 48	29.8 9.0 23.8 12.6 12.0 19.8 22.5 14.4 19.0 13.6 15.1	17.0 12.3 20.3 6.2 13.5 16.9 20.3 12.6 14.9 12.5 10.7	19.3 11.3 19.8 8.4 13.7 16.0 19.9 10.9 15.3 11.0 15.2		34343333333					
LOWER YELLOWSTONE	- Powde	r River												
Muddy Creek G.S. Munkres Pass Onion Gulch Soldier Park Sour Dough	7E28 7E8 7E27 7E5 7E6	7800 9700 8100 8700 8500	4/30 4/30 4/30 5/1 5/2	13 40 39 27 24	3.6 11.7 12.5 7.5 7.3	5.7 12.2 10.3 10.8 10.5	3.6 11.4 8.2 6.6 10.4	9.8** 5.9** 5.4*	3					

<sup>\*</sup>Less than 15 years in 1938-52 period. Average for 15 years nearest the base period. \*\*Average for period of record.



## MONTANA SNOW SURVEYS ABOUT MAY 1, 1959

SNOW COVER MEASUREMENTS														
COLUMBIA				1959	DIJOM C	Past Record Tot								
DRAINAGE BASIN			Date	Snow	Water	1	Content		Years					
AND			of		Content			15-Year	of					
SNOW COURSE	No.	Date	Survey	(In.)	(In.)	1958	1957	_	Record					
			major damagaman di San Japan Jamas an Angara an Andrews				The second section is a second	1938-52	quanto for a magazina de militar magazina					
KOOTENAI RIVER (al	bove Lib													
Baree Creek	15B11	5500	4/29	103	52.0	48.1	46.6	48.6**	3					
Baree Mountain	15B1	6000	4/29	116	53.6	42.9	45.6	40.6	22					
Brush Creek	14A4	5000	4/30	30	12.0	T.	11.8	8.7**	15					
Ferguson	Can	2900	4/29	49	22.3	16.4	17.1	17.4**	13					
Fernie	Can	3500	4/28	0	0	0	0	3.2**	13					
Gray Creek	Can Can	5100 3800	4/28 4/29	54 0	19.3	17.5	21.5	20.3**	11					
Kimberley Marble Canyon	Can	5000	5/4	49	16.8	0.7	14.2	13.6**	3 12					
New Fernie	Can	4100	4/28	Patch		0	0	8.8**	8					
Red Mountain	15A1	6000	4/29	51	20.7	21.5	18.8	15.9	22					
Sandon	Can	3500	5/1	14	6.6	-	5.3	8.6**	9					
Sinclair Pass	Can	4500	5/1	4	0.7	0	1.9	3.0**	9					
Smith Creek	16A1	4800	4/29	99	46.3	48.7	43.2	37.3*	20					
Sullivan Mine	Can	5100	4/29	31	13.0	13.5	12.1	11.5**	13					
Weasel Divide	14A7	5450	4/28	89	37.0	34.0	32.6	32.7*	20					
FLATHEAD RIVER														
Basin Creek	13B14A	5000	4/30	0	0	T.	0	2.1**	8					
Big Creek	13B3	6750	4/30	136	65.4	56.4	48.1	46.4**	10					
Brush Creek	14A4	5000	4/30	30	12.0	T.	11.8	8.7**	15					
Coyote Hill	13B10	4200	5/1	6	2.1	1.4	0.7	2.2**	12					
Desert Mountain Hell Roaring Div.	13A2 14A3	5600 5700	4/29 4/27	39 88	16.5 39.3	15.8 32.4	15.0 30.6	9.6 28.0*	22 17					
Holbrook	13B13A	4530	4/30	0	0	0	0	1.5**	8					
Logan Creek	14A5	4300	4/30	8	2.2	0	6.9	1.6*	20					
Marias Pass	13A5M	5250	4/29	50	21.4	15.5	17.0	9.9	24					
N. Fork Jocko	13B7	6330	5/1	125	62.4	51.7	42.8	41.8**	11					
Spotted Bear Mt.	13B2M	7000	-			11.2	9.4	12.2**	8					
Strawberry Lake	13A10	6500				47.3	42.9	41.9**	10					
Trinkus Lake	13B1	6500				48.1	42.0	42.2**	10					
Trout Lake Twin Creeks	13A12M	3600				3.3	6.4	8.8**	11					
Upper Holland	13B11 13B5	3580 7000				T. 36.5	0 34.2	1.3** 36.5**	8 8					
Weasel Divide	14A7	5450	4/28	89	37	34.0	32.6	31.2*	20					
		7.17	7/	-,		24.0	3.500	<i></i>						

<sup>\*</sup>Less than 15 years in 1938-52 period. Average for 15 years nearest the base period. \*\*Average for period of record.



# MONTANA SNOW SURVEYS ABOUT MAY 1, 1959

COLUMBIA DRAINAGE BASIN AND SNOW COURSE No. Date	Date of Survey	1959 Snow Depth (In.)	Water Content	L	ast Reco Content		Total
AND	$\circ f$	Depth	Content	114 501	001100110		
						15-Year	of
			(In.)	1958	1957	Average 1938-52	Record
CLARK FORK							
Baree Creek 15Bll 5500	4/29	103	52.0	48.1	46.6	48.6**	3
Baree Mountain 15B1 6000	4/29	116	53.6	42.9	45.6	40.6*	22
Chessman Res. 12C5 6200	4/30	7	2.5	4.8	3.1	1.6	23
Coyote Hill 13B10 4200	5/1	6	2.1	1.4	0.7	2.2**	12
Fish Lake Airstrip 1502 5000	4/30	95	40.6	41.7	42.9	43.0**	3
Freezeout Summit 15B10 6800	5/4	87	37.7	36.4	36.2	31.5*	17
Hoodoo Creek 1501 6200	4/30	119	52.1	47.2	51.0	43.4*	16
Lubrecht For. #6 1308 5400	5/4	0	0	0	0		7
N. Fork Jocko 13B7 6330	5/1	125	62.4	51.7	42.8	41.8**	11
Pipestone Pass 12D1 7200 Smith Creek 16A1 4800	5/1	11	3.2	10.4	5.2	2.2*	19
Stemple Pass 12C1 6900	4/29 5/1	99	46.3	48.7	43.2	37.3* 6.8*	20
Storm Lake 1307 7780	4/30	37 38	13.4 15.3	13.4	16.4	14.2*	24 17
Tenmile, Lower 1202 6250	5/3	76 7	2.3	6.7	6.6	2.0	23
Tenmile, Middle 1203 6800	5/2	29	9.2	13.4	11.9	6.9	24
Tenmile, Upper 1204 8000	5/2	39	14.6	18.5	15.1	10.4	23
TV Mountain 14B1 6800	5/5	61	24.6	21.0	21.1	21.8**	3
#49 Meadows 15B3 5000	4/30	62	25.8	31.5	28.4	28.8*	17
#Lookout 15B2 5250	4/30	77	34.6	38.4	35.3	22.1*	22
BITTERROOT							
Gibbons Pass 13D2 7100	4/29	53	22.4	26.5	26.0	20.6*	23
Nezperce Camp 14D2 5580	4/30	23	9.8	14.1	11.5	5.5*	20
Nezperce Pass 14D1 6575	4/30	26	11.6	17.1	11.7	10.2*	21
#Lolo Pass 14C5 5230 #Powell R. S. 14C6 4230	4/29 4/29	70 0	32.2	31.1	33.8	25 <b>.5*</b>	19

<sup>\*</sup>Less than 15 years in 1938-52 period. Average for 15 years nearest the base period. 
\*\*Average for period of record. 
#Adjacent Basin.



# STATUS OF RESERVOIR STORAGE May 1, 1959

BASIN		LE STORAGE - 1000 ACRE FEET								
& &		USABLE CAPACITY	USAD	TE STORAGE	5 - TOOO W	1938-52	+			
STREAM	RESERVOIR	1000 A.F.	1959	1958	1957	AVG.	YRS.			
D11001111	TUDDITY OLI,	1000 11.12	1///	1770	1///	n.d.	11000			
MISSOURI RIVER BA	SIN - MONTANA									
Beaverhead	Lima	84.0	40.6	50.9	15.2	59.9*	18			
Madison River	Hebgen Lake	345.0	181.2	167.8	175.7	234.0	23			
Madison River	Ennis Lake	41.0	37.3	33.0	37.5	32.6	23			
Hyalite Creek	Middle Creek	8.0	4.8	4.5	3.7	4.6**	7			
Missouri River	Canyon Ferry	2043.0	1925.0	1831.0	1478.0	1353.0**	5			
Missouri River	Hauser Lake			-						
	& Lk. Helena	62.5	50.4	52.9	62.5	42.1*	19			
Missouri River	Lake Helena	10.4	6.5	7.2	10.4	5.1**	13			
Missouri River	Holter Lake	81.9	49.1	71.9	12.6	55.2	21			
N.Fk. Sun River	Gibson	105.0	73.2	39.4	46.1	73.0	23			
N.Fk. Sun River	Willow Creek	32.3	28.7	24.0	24.5	14.1	23			
N.Fk. Sun River	Pishkun	32.0	19.2	17.0	19.0	18.5	23			
Marias River	Tiber	1316.0	638.3	674.9	578.7	-	3			
Birch Creek	Swift	30.0	30.2	24.7	28.7	24.9	23			
Dupuyer & Birch	Lake Francis	112.0	97.2	97.4	92.0	78.8	23			
Judith River	Ackley Lake	5.8	-	-	3.7	4.4*	19			
Missouri River	Ft. Peck 3/	19410.0	9659.0	8102.0	6372.0	11970.0*	18			
Milk River	Fresno	127.2	124.4	125.5	124.4	93.6*	18			
Milk River	Nelson	66.8	53.0	55.5	58.9	31.8	23			
W. Rosebud Cr.	Mystic Lake	20.8	1.4	3.2	3.3	2.8	23			
Tongue River	Tongue River	73.9	23.8	13.9	16.0	19.6*	18			
Swiftcurrent Cr.	Sherburne Lake	66.1	29.2	26.9	17.7	24.9	23			
MISSOURI RIVER BA	SIN - WYOMING									
Shoshone River	Buffalo Bill	440.0	44.7	106.2	97.6	266.6	24			
Wind River	Boysen	408.6A0		197.6	202.5	237.9**	7			
Wind River	Pilot Butte	31.6	17.9	27.7	27.7	20.9	23			
Bull Creek	Bull Lake	152.0	40.0	56.6	60.1	45.6	20			
Belle Fourche	Key Hole	190.0A(	•	3.2	3.2	13.0**	7			
DOLLO 1 OUL ONO	ney note	1/0.0A	7 704	) . ~	٠, ٨	10.01				

<sup>\*</sup> Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.

\*\* Average for period of record.

<sup>3/</sup> Gross contents: usable capacity less 617.0 A.F; minimum power pool 4,500 A.F. AC Active Capacity; USBR Billings.



# STATUS OF RESERVOIR STORAGE May 1, 1959

BASIN		USABLE	USABLE	STORAGE			
& STREAM	RESERVOIR	CAPACITY 1000 A.F.	1959	1958	1957	1938-52 AVG.	YRS.
MISSOURI RIVER BA	SIN - NORTH DAKO						
Heart River Heart River Missouri River James River	Heart Butte Dickinson Garrison Lake Jamestown	54.8AC 4.3AC 13805.0AC 20.0AC	67.5 5.5 4051.4 1.9	63.1 5.7 4502.0 4.9	50.6 5.1 1102.5 15.0	66.2** 5.4** -	9 8 4 2
MISSOURI RIVER BA	SIN - SOUTH DAKO						
Belle Fourche Cheyenne River Cheyenne River Grand River Missouri River Missouri River Missouri River Cheyenne River	Belle Fourche Angostura Deerfield Shadehill Ft. Randall Gavins Point Oahe Pactola	185.0AC 160.0AC 15.1AC 84.0AC 4900.0AC 385.0AC Total 55.0AC	63.9 9.6 82.8 3010.2 234.3 696.0 20.7	98.8 68.8 12.2 152.8 2830.5 243.7	62.5 40.1 9.2 82.4 2132.5 225.7	- 12.8** 148.4** - - -	33664202
COLUMBIA RIVER BA	SIN - MONTANA						
Flint Creek S. Fk. Flathead Flathead River Flathead River <u>6</u> / Flathead River <u>7</u> /		31.0 3500.0 1791.0 42.8 98.6	21.4 1904.0 1174.0 39.1 44.5	21.6 2276.0 722.0 36.9 24.1	16.0 1970.0 679.0 39.6 35.0	21.7* 1986.0** 981.0 25.8* 48.5*	19 5 15 18 18

<sup>\*</sup> Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.

\*\* Average for period of record.

<sup>6/</sup> Camas Reservoirs are shown as a sum of (4) small reservoirs on the west side of Flathead Lake located on Dry Creek and Little Bitterroot River.

<sup>7/</sup> Mission Valley Reservoirs are shown as a sum of (8) small reservoirs located south and east of Flathead Lake. Both Camas and Mission Valley reservoirs are operated by the Indian Irrigation Service.

AC Active Storage; USBR Billings.



# INDEX TO MONTANA & NORTHERN WYOMING SNOW COURSES

Drainage Basin Montana and Course Name Number	Elev. L	ocation oc. at. Twp.			Heasuring Dates	Heasured By	Drainage Basin and Course Name	Kontana Rumber	<u>Riov.</u> MISSOURI	Location Sec. Lat.	Twp.	Range Long.	Record Began	Measuring	Heasured By	Drainage Basin and Course Name	Montana Number	Elev.	Loceti Sec. Lat.	īvp.	Long.	Record Began	Keasuring Cates	seasured By
(RCCB-BFAVERHEAD)							(UPPER YELLOW	STONE)								(TONGUE RIVER	oont.)							
Lakeriew Ridge 11E3 Lakeriew Canyon 11E4 Limekiln 12E2 Wr te Pine Ridge 12E1 (HORNE PRAIRIE)	6930 2 6950	27 址 26 址 5 15S 18 址	2W 2W 9W 9W	1948 1948 1948 1948	3,4,5 3,4,5 3,4 3,4	10 10 1	Camp Senia Canyon Cooke City Crevice Mt. Independence Lake Camp Lupine Creek	901 1023 1027 1025 1026 1024 1081		2 lih *-lih * 25 22 22 lih *-3h * lih *-5l; *	6S 9S 9S 7S	188 110°-30° 1hB 98 12E 110°-2h° 110°-37°	1937 1935 1940 1936 1938	1,2,3,4,5 1,2,3,4,5 3,4 3,4 1,2,3,4,5 1,2,3,4,5	1 6 6 6 6	Horse Trail Div. Lake Geneva North Tongue Sibley Lake Sucker Creek Steamboat Point Wood Rock O.S.	7619 7616 7615 7611 7612 7610 7613	9200 9000 8800 8000 9000 7500 8500	29 7 17 10 19 32 3	55N 52N 55N 55N 55N 56H 51N	90¥ 86¥ 89₩ 88₩ 87₩ 87₩ 88₩	1956 1956 1956 1956 1956 1956 1956	2,3,4,5 2,3,4,5 2,3,4,5 2,3,4,5 2,3,4,5 2,3,4,5 2,3,4,5	1 1 1 1 1 1
Bloody Dick 13D10 Oold Stone 13D9 Leght Pass 13E1	8100 1 7460	12 8S 11 8S 9 10S	16¥ 16¥ 15₩	1948 1948 1948	3,4 3,4 3,4	1 1 1	Locgepole (SHIELDS RIVE	981 R)	8200	32	56N	106W	1940	2,3,4,5	1,4	(POWDER RIVER		9200	4	1.20	Q) er	2056		,
Terrell Creek 13012 Trail Creek 1382 Selvny Junction 13011 , 819 HOLS)	7090 1 6800 2	14 98 15 108 27 88	15W 15W 15W	1948 1948 1948	3,4 3,4 3,4	1 1	Poreupine LOWER YELLOWSTONE (WIND RIVER)	10C)	6500	10	ħΝ	108	1938	3,4	1	Grazy Woman Muddy Greek O.S. Munkere Pass North Powder #2 Onion Gulch Soldier Park	6E2 6E1 7E8 7E36 7E27 7E5	8200 7800 9700 8300 8100 8700	6 2 11 20 31 36	47N 48N 48N 47N 48N 51N	8LIN 8SW 8SW 8SW 8SW	1956 1956 1950 1956 1956 1950	2,3,4,5 2,3,4,5 2,3,4,5 2,3,4,5 2,3,4,5 2,3,4,5	1 1 1 1 1 1
Rig Mole Pass 1303	6900 2	28 33 24 33 22 33	18₩ 16₩ 17₩	1948 1948 1948	3,4 3,4 3,4	1	Rig Warm Brooks Lake #3	9#12 10F8	8800 9200	36 23	น2N ไม่เพ	109W 110W	1955 1939	2,3,4,5	1	Sour Dough	7E6	8500	17 UMBIA RI	49N VER BAST	M TIS	1936	2,3,4,5	1
East Boundary 1305 dbbons Pass 1302 Jahnke Greek 1308 Miner Forks 1306 Miner Lake 1307	7100 7340 2 7300 2	22 38 4 25 25 75 24 65 .0 65	19W 16W 17W 16W	1946 1948 1948 1945	3,4 1,2,3,4,5 3,4 3,4 3,4,5	i,3 1 1	Burreughs Creek Dinwoodie Dry Creek DuNoir East Fork	9F1 9F10 9F9 9F6 9F13	8800 10000 9500 8750 9200	15 21 34 27 23	138 398 148 1428 1438	107W 105W 6W 108W 104W	1948 1948 1948 1940 1956	2,3,4,5 2,3,4,5 2,3,4,5 2,3,4,5 2,3,4,5	1 1 1 1 1	Baree Creek Baree Mountain	15B1 15B1	5500 6000	6	25H 25H	30W	1956 1937	և,5,Տ <u>։</u> և,5,Տ <u>։</u>	2 2
(MISE RIVER)  Widerson Miv. 13014 Elx Rore 13015	7000 1 8450 1	کیا 5	12W 12W	1948 1935	3,4,5	1 3	Geyser Creek Little Warm Sheridan R.S. #1 Sheridan R.S. #2	9F7 9F8 9F5 9F1h	8500 9500 7500 7500	12 24 3	117N 117N 117N	108W 108W 109W 109W	1948 1948 1939 1955	2,3,4,5 2,3,4,5 2,3,4,5 2,3,4,5	1 1 1 1	Red Mountain Weasel Divide FLATHEAD RIVER	15A1 1hA7	5450	8	36N 37N	25M 2FM	1937	3,4,5,5	1,2
Wise River 13D13 (RUBY RIVER)	6300 1	.5 2S	12W	1948	3,4	1	- I-Grees Ranch Iogwotee Pase	9F3 10F9	8000 9600	1 29	PTM P3N	107W 110W	1940 1936	2,3,4,5	n	Basin Creek Rig Creek Brunh Creek	13811.4 1383 11.41.	5000 67 <b>5</b> 0 5000	11 647 13	19N 22N 30N	12¥ 18₩ 26₩	1951 1941 1937	2,3,4,5 3,4,5 3,4,5	5 1,2
Flashlight 12D3  MU., SUN RIVER	6950 2	2 88	7₩	1945	3,4,5	1	(POPO ACIE RI Blue Ridge Bruce's Camp Hobb's Park	802 805 903	9500 6500 10000	23 24 22	31N 32N 25	101W 101W	1939 1955 1948	2,3,4,5 2,3,4 2,3,4,5	1 1	Cattle Queen Decort Mountain Hell Roaring Div. Holbrook Kiehenehn	13A1 13A2M 11hA3 13B13A 11hA6	1700 5600 5770 1530 3886	7 24 35 18 14	35N 31N 32N 21N 21N	17W 19W 22W 13W 22W	1939 1937 1942 1951 1951	3,4,5 1,2,3,4,5 3,4,5 1,2,3,4,5	6 1,2 1,2 2
Bebjen 11E5 West Yellowstone 11E7 Norrie Busin 1052	6550 2: 6700 3 7500 址9	L 13S	JE 5E 110°−1⁄2	1934 1934 1936	1,2,3,4,5 1,2,3,4,5 3,4	3 3 6	Mosquito Park R.S Sawmill Glade South Pass St. Lawrence Trout Creek (OML CREEK) W	904 801 803 9711 902	9500 8500 9000 9000 8400	23 3 13 26 5	25 31N 30N 1N 25	101W 101W 101W 3W	1940 1939 1939 1940 1948	2,3,4,5 2,3,4,5 2,3,4,5 2,3,4,5 2,3,4,5	1 1 1 1 1	Logan Creek Marias Pass Mineral Creek Quintonkon Spotted Bear Mt. Strawberry Lake	14A5 13A5N 13A16 13A13 13B2M 13A10	4300 5250 4000 3800 7000 6500	弘 29 11 23	30H 30R 35N 26N 25N 28N	24W 14W 17W 17W 15W 19W	1937 1934 1957 1951 1948	3,4,5 1,2,3,4,5 3,4,5 2,3,4,5 3,4,5 3,4,5	2 3 6 1,2 1,2
ALLATIA RIVER							Besvers Mill Owl Creek	9F2 8F1	8900 8700	6 36	43N 43N	101A 101A	1948 1948	2,3,4,5 2,3,4,5	1	Trinkus Lake Treut Lake Twin Creeks Upper Holland Lk.	1381 13412H 13811 1385	6500 3600 3580 7000	9 21 14 28	25N 28N 26N 20N	17W 17W 16W 16W	1948 1948 1951 1948	3,4,5 3,4,5 2,3,4,5	2 1,2 1,2
evil's Slide 1004 cod Me4dow 1003 hew world 1001 1-Mile 11E6	8100 11 6600 27 6700 21 7150 :	2 45	6E 6E 5E	1935 1935 1939 1934	2,3,4,5 2,3,4,5 1,2,3,4,5 1,2,3,4,5	2,1 2,1 7 3	CREYBULL RIVE Timber Creek #1 Timber Creek #2 Wood River #1	9E2 9E3 9F1	8 8800 8800 8000	25- 25 28	47H 47H 46N	103W 103W	1948 1955 1939	2,3,4,5 2,3,4,5 2,3,4,5	1 1	CLARK FORK Baree Creek Baree Hountain Coyote Hill	15B11 15B1 13B10	5500 6000 h200	6 1 12	25N 25N 18N	30W 31W 16W	1956 1937 1952	3,4,5 4,5,5\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	2 2 2 2
MI WOURT RIVER MAIN STEM							Wood River #2 (SHOSBONE RIV	9125	8000	28	46N	103W	1956	2,3,4,5	ī	El Dorado Mine Pred Burr Pass Freezeout Summit	1309 13011 15810	7800 8000 6800	23 12 21	8N 6N 15N	12W 13W 27W	1949 1957 1937	4 3,4,5 4,5	1 1 2
Cuessaan Reservoir 1205 Crystal Lake 901 Emsshopper 1002 Kings Hill 1001 Picric Grounis 1206 Destone Pass 1201	6200 6100 1: 7000 1: 7950 3 6500 1: 7200 1:	9 9n 15 13n 0 5n	5W 18B 8E 7E 6W 7W	1936 1941 1938 1934 1941 1938	1,2,3,4,5 3,4 3,4,5 2,3,4 2,3,4,5	3 1,2 2 3 4	Bast Entrance Sylvan Pass (NOWOOO CREEK	10E6 10E5	7000 7100	17 12	52N 52N	110A 100A	1948 1936	1,2,3,4,5 1,2,3,4,5	6	Gold Creek Lk. Moodoo Creek Intergaard Lubrecht Porest # North Fork Jocko	13010 1501 1304	7200 6200 6450 6450 6450	3 6 7 7	8N 14N 5N 14N 17N	12W 27W 13W 15W	1949 1937 1936 1951 1941	1,5 2,3,4 1,2,3,4,5 3,4,5	1 2 4 12 5
temple Page 1201 Ten Mile Creek L 1202 Ten Mile Creek M 1203 Ten Mile Creek W 1204 TETON KIZER)	6900 10 6250 1 6800 1 8000 10	.3 8M 3 8N	7W 6W 5W	1934 1935 1934 1935	3,4,5 1,2,3,4,5 1,2,3,4,5 1,2,3,4,5	3 3 3	Cold Springs Camp Medicine Lodge Lk Munkers Pass North Powder Onion Oulch	5 762L 7E8 7E36 7E27	8700 9500 9700 8300 8100	1 7 11 20 31	50N 51N 48N 47N 48N	83W 87W 85W 85W 85W	1956 1956 1950 1956 1956	2,3,4,5 2,3,4,5 2,3,4,5 2,3,4,5 2,3,4,5	1 1 1 1	Pipestone Pase Red Lion SLide Rock Mt. Southern Crees Stemple Pass	1201 13012 1302 1305 1201	7200 7000 7100 6500 6900	10 27 35 8 16	1N 6N 10N 5N 13N	7W 13W 16W 13W 7W	1938 1958 1937 1936 1934	2,3,4,5 3,4,5 4 2,3,4 3,4,5	1 1 1 4 3
Freight Creek 12Al Waldron Greek 12B2 Wost Fork 12B1	6000 1 5600 1 6000		10W 9W 9W	1948 1948 1948	3,4 3,4	1 1 1	Tensleep Lake Tensleep R.S. Tyrell B.S. (SHELL CREEK)	7E26 7E7 7E35	9075 8300 8300	33 30 30	50n 49n 49n	86W 86W 86W	1956 1935 1956	2,3,4,5 2,3,4,5 2,3,4,5	1 1 1	Storm Lake Stuart Mill Stuart Mountain TV Mountain BITTERMOOT RIVER	1307 1306 1301 1481	7780 6500 7400 6800	19 19 6 33	կո Տո 11ւո 15 ո	13¥ 13¥ 18₩ 19₩	1939 1936 1936 1956	2,3,4 2,3,4 1,2,3,4,5	1 1,2 1
(SUN RIVER)  Benchmark 1288 Cabin Greex 1286 5-Bull 1289 Oates Park 1285	5500 5 5100 3 5600 3 5300 3	6 20N	10A 10A 10A	1948 1949 1948 1949	3, l, 3, l, 3, l, 3, l, 3, l, 3, l,	1 1,2 1,2	Bald Mountain Beaver-Tongue Div Bone-Spring Div. Granite Creek Cam Granite Pass	7E18 P 7E22 7E17	9600 9200 9200 7800 8950	33 12 32 15	56N 55N 55N 53N 54N	91₩ 91₩ 89₩ 89₩ 88₩	1956 1956 1956 1956 1956	2,3,4,5 2,3,4,5 2,3,4,5 2,3,4,5 2,3,4,5	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	East Fork R.S. Gibbons Pass Lolo Pass Nez Perce Camp Nez Perce Pass Powell R.S.	1301 1302 1405 1402 1401 1406	5400 7100 5230 5580 6575 4230	16 16 19&20 32 33	26 N 37 N	17W 19W 15E 23W 17S 14E	1937 1934 1956 1937 1937	4 1,2,3,4,5 3,4,5,5 3,4,5 1,2,3,4,4,6,5 3,4,5,5	,5½ 1
Ocat Mountain 1287 Wrong Ridge 1283 wrong Greek 1284  (MARIAS RIVER)	7000 26 6800 1 5700 33	0 21N 7 25N	10A 10A 10A	1949 1949 1949	3,4 3,4 3,4 3,4	1,2 3 1,2 1,2	Horse-Trail Div. Ranger Creek Shell Creek  (PORCUPINE CR	7519 761 7623 EEK) Wyomi	9200 8800 9600	29 32 12	55N 53N 52N	90¥ ¥63 ¥88	1956 1935 1956	2,3,4,5 2,3,4,5 2,3,4,5	1	Skalkeho Summit St. MARY RIVER	1303	7259 <u>S</u> A	30 SXATCHE	6n AN RIVER	17W BASIN	1937	li .	1
Mar'as Pass 13A5N (MILE RIVER)	5250 3	4 зон	ijА	1934	1,2,3,4,5	3	Five Spge. Falls Medicine Wheel (TONGUE RIVER	7E31 7E30	7500 9000	19 24	56n 56n	92W 92W	1956 1956	2,3,4,5 2,3,4,5	1	Iceberg Lake #3 Josephine Upper Josephine Lower # Mount Allen #7	13A7	5600 5000 4900 5700	48°-50° 48°-50° 48°-47° 48°-46°		113°-43' 113°-42' 113°-41' 113°-41'	1956 1955 1922	5 5 5	3,°
Rocky Boy 9Al	5200 1	5 2814	16E	1941	3,4	7	Beever Tongue Div	. 7E20 7E2	9200 7700	12	55N 53N	91¥ 86¥	1956 1935	2,3,4,5	1	Piegan #6 Ptarmigan #8	13A6 13A8	5500 5800	180-16 <del>3</del>	•	1130-413 1130-4413		5	3,9 3,9
(MUSSELSHELL RIVER) Orosshopper 1002	7000	0 04	D.F.	1029	2.1		Big Goose #2 Bone-Spring Div.	7E32 7E18	7700 9200	4 32	53N 55N	86¥ 89¥	1955 1956	2,3,4,5 2,3,4,5	1 1									
TON!	7000 1:	9 9W	8E	1938	3,4	2	Burgess R.S. #2 Burgess R.S. #2 Dome Lake #1 Dome Lake #2 Gloom Creek Granite Pass	761 7633 763 7634 7614 7617	7900 7900 8800 8800 9300 8950	36 36 11 11 32 19	56N 56N 53N 53N 55N 55N	89W 89W 67W 67W 87W 86W	1950 1955 1950 1950 1956 1956	2,3,4,5 2,3,4,5 2,3,4,5 2,3,4,5 2,3,4,5 2,3,4,5	1 1 1 1 1 1 1 1	b. Numerale 1,2, b. Numerale refe 1. Soil Conserve 2. U. S. Forest 3. U. S. Geologi b. Montana Power	r to Agend tion Servi Service cal Survey	y that se			7. M 8. C 9. D	follower ontana Ea ity of Bo ominion w	periment Stat	ion Bureeu
White and substitute to be 1970																5. U. S. Indian 6. National Park	Service		Soil Mo		11. U	. S. Bure	au of Reclama	tion



# NOTICE

The SCS Snow Survey office is moving to the State Office, 33 E. Mendenhall Street, Bozeman, Montana. We hope to be in our new quarters by March 20.

New mailing address:

Soil Conservation Service Box 855 Bozeman, Montana

New telephone number: JUniper 6-5488, Ext. 35.

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# Agencies Cooperating in Collecting Data Contained in this Bulletin

- U. S. Forest Service Region I, Missoula, Montana
- U. S. Geological Survey Helena, Montana
- U. S. Army Corps of Engineers Portland, Oregon Seattle, Washington Omaha, Nebraska Riverdale, N. D.
- U. S. Indian Irrigation Service St. Ignatius, Montana
- U. S. Weather Bureau Helena, Montana
- U. S. Fish & Wildlife Service Red Rock Lakes Refuge Monida, Montana
- U. S. Bureau of Reclamation Billings, Montana Boise, Idaho
- Montana Power Company Butte, Montana
- City of Bozeman Bozeman, Montana
- Bonneville Power Administration Portland, Oregon

- National Park Service Yellowstone National Park Glacier National Park
- Montana Experiment Station Montana State College Bozeman, Montana
- Agricultural Experiment Station North Montana Branch Station Havre, Montana
- Montana State School of Forestry Montana State University Missoula, Montana
- Soil Conservation Service Montana, Wyoming, Idaho
- Soil Conservation Districts
  Montana Counties
- Johnson Flying Service, Inc. Missoula, Montana
- Water Rights Branch
  Dept. of Lands & Forests
  Victoria, British Columbia
- Department of Northern Affairs & National Resources Calgary, Alberta



Furnishes the basic data necessary for forecasting water supply for irrigation, domestic and municipal water supply, hydro-electric power generation, navigation, mining and industry

"The Conservation of Water begins with the Snow Survey"